Data Curation Services
What We Do

Data curation is the active management of digital collections that are openly accessible for scholarly use, including text, image, audio, video, or other media types. We can help you:

- Appraise and digitize content in traditional media for discovery and online access.
- Design metadata solutions to ensure the nature of content and the purpose of project.
- Manage digital assets and make them accessible online in user-friendly ways.

Digital preservation is the active management of digital content over time. It combines policies, strategies, and actions to ensure ongoing access to and accurate rendering of authentic reformatted and born-digital content. We can help you:

- Collaborate in digitizing or fragile formats to sustainable formats.
- Store content in trusted repositories for long-term access.
- Use reliable tools to harvest, build, and preserve collections of web content.
Data Curation

Data curation is the active management of data to maintain and extend its value over time. It includes effectively organizing data for access, documenting context for reproducibility, and securely preserving the physical integrity of the work. We can help you with all stages of data management required by funding agencies.

**DMP Tool**
Create, review, and share data management plans that meet institutional and funder requirements. Examples:
- NIH Office of Digital Humanities
- NIH Generic
- NSF Generic
- NSF Biological Sciences
- NSF Engineering
- NSF Social, Behavioral, Economics Sciences

**dash**
A simple self-service tool to archive and share your research data for accelerated advancement of knowledge. Examples:
- Barnett, Carlin C; Calabret, Serenzo Y; Daley Y; Mobley, David L (2018) Simulation input and output data analysis for calculating partition coefficients of small molecules in oil and water and cyclohexane/water. UC Irvine. Collection. doi:10.7281/t9v19z6m

**EZID**
A service making it easy to create and manage long-term, globally unique identifiers for your data and sources, ensuring their future discoverability and avoiding link rot. Examples:
- ark:8273+6oo481f
  - doi:10.5061/dryad.19m6821
  - Learn about ARK | Learn about DOI
Data Curation Program supports active and ongoing management of data produced by UCSB researchers throughout the research process to cultivate broader awareness of the continued utility of data within, and possibly beyond disciplinary origins. We aim to ensure that data are well-described and findable; accessible and usable; citable; and sustainably preserveable.

We offer the following services:

**Planning**
- Data management planning and proposal assistance
- Funder data management requirements
- Using the DMPTool

**Day-to-day management**
- Best practices in data management
- Data management tools and services
- Metadata standards
- Metadata population and extraction strategies

**Publication**
- Data publication journals
- Obtaining persistent identifiers for data
- Data citation formats
- Data copyright and licenses

**Preservation/archival**
- Selection and usage of data repositories

Typically, we offer consultation and teaching though we are open to other forms of engagement.
JOHNS HOPKINS UNIVERSITY LIBRARIES
Data Management Services
http://dms.data.jhu.edu/

Data Management Services
~~ Serving Researchers on Homewood and Medical Campuses ~~

Effective data management can increase the pace of the research process, contribute to the soundness of research results, and meet funding agency requirements by making research data easy to share.

Supporting data management at every point in your research

Where are you in your project?

**Just Starting**
Plan Your Research Project

**In Progress**
Manage and Analyze Data

**Almost Done**
Publish and Share Data / Software

Our Services

**Consulting**
Assistance with writing data sharing or management plans

**Training**
Best practices for data management and sharing

**Archiving**
Archive your research data for sharing & preservation

Representative Documents: Data Curation Services
Research Data Services

Your research data are important. Research Data Services is a network of services throughout the Library to assist you during all phases of the research data lifecycle. For questions about research data or to schedule a consultation, please get in touch with your subject librarian or email us.

We provide or are planning to provide services in the following areas:

- **Data Management Planning**: helping plan for managing, sharing and curating data and develop Data Management Plans (DMPs) that meet funder requirements.
- **Discovery & Access**: assisting in discovering, accessing, and acquiring different types of research materials, including data.
- **Data Organization & Management**: helping researchers to understand, develop and apply strategies for organizing and managing their data.

- **Metadata & Documentation**: locating standards for documentation that capture the details of generating, processing and analyzing data so it can be discovered, understood and reused.
- **Data Sharing & Publication**: helping disseminate research data for discovery, access and reuse in ways that enable researchers to receive credit for their work.
- **Preservation**: taking action to sustain the accessibility and scholarly value of data over time.
- **Data Visualization**: a rich and diverse set of practices, methodologies and tools from hand drawn charts to interactive web maps to immersive 3-D environments.

Images courtesy of Dimitry Sunseifer, ambleru adakera, Zlatko Najdenovski, Norbert Kucsera, Giorgio Libold, and Pascal Cori-lacoste via the Noun Project.
Our Suite of Services

DRUM is part of a broad suite of services, offered at no cost, that support research data management on campus. Larger data projects may need additional support; please request a consultation. We also refer you to other campus-based services. See [http://lib.umn.edu/datamanagement](http://lib.umn.edu/datamanagement) for additional information.

**Plan**
Support for Writing Data Management Plans (DMP)

We provide one-on-one assistance, templates, and consultation when writing DMPs, now required by some grant funding agencies (e.g., NSF and NIH).

- Grant deadline? [contact us](mailto:contact) for timely consultation and feedback on your next DMP.
- Not sure where to start? Use our [online templates](https://conservancy.umn.edu/) to help draft a DMP.
- Sensitive data? Learn how to create [IRB consent forms](https://conservancy.umn.edu/services/) that facilitate sharing later.

**Manage**
Metadata Consultation and Data Management Training

Data management consultants will help with topics such as:

- [Metadata advice and consultation](https://conservancy.umn.edu/services/): Larger projects may want to include library staff as co-share on grant-funded projects (limited availability).
- Providing on-demand [training and education modules](https://conservancy.umn.edu/services/) to get you and your staff up to speed on data management best practices.
- [Refer to campus services](https://conservancy.umn.edu/services/) such as storage, backup, analysis, and tools for preparing sensitive data for sharing (e.g., de-identification).

**Share**
Data Repository and Curation Services

UMN researchers may deposit data to the Libraries’ Data Repository for U of M (DRUM), subject to our [collection policies](https://conservancy.umn.edu/services/). Data sets submitted to the Data Repository are reviewed by data curation staff to ensure that data is in a format and structure that best facilitates long-term access, discovery, and reuse.

- [Read more about the Data Repository for U of M (DRUM)](https://conservancy.umn.edu/services/)
- [Browse the collection of available data](https://conservancy.umn.edu/services/)

**Grant Partner**
Full Lifecycle Support for Data

On request

The Librarian offer a full suite of support for PIs that seek support for data management, data sharing, and long-term preservation for data generated by funded grants. Costs determined per grant-funded project, [contact us](mailto:contact) to discuss your project.

- Want to include the Data Repository for U of M in your next grant? Use our [boilerplate language](https://conservancy.umn.edu/services/) for your Data Management Plan.
About

Curating Notre Dame's Research and Scholarship for Study throughout Time

Manage

- Are you required to have a data management plan?
- Do you work with a team or need to regulate levels of access?
- Do you want to link your work to supplemental materials of multiple formats?
- Do you want to curate and elevate your entire portfolio of work?

CurateND is a research portal that allows for the management of your research portfolio on several levels. In response to funding mandates, portal features and our related Center for Digital Scholarship services offer streamlined consultation for the creation of data management plans. Upon deposit, you can select different access privileges and embargo periods that allow you to share research results with groups and regulate access to your works while in progress.

In the digital age, research "data" comes in multiple formats, often within a single published work. CurateND is designed to accept, manage and securely preserve files of any format including datasets, articles, images, video, whitepapers, presentations, and more. And, you can deposit and illuminate as much of your portfolio of work and supplemental materials as you choose.

Get Started
Preserve

- Does your funding mandate a plan for long-term preservation?
- Do you want assurances that you can locate your research and related works in the future?
- Do you want to preserve conference proceedings?
- Is it important to steward your research for future scientists and scholars?

CurateND employs preservation standards that meet the requirements of funding agencies for long-term preservation and curation over the life-cycle of research. Whether or not a project is grant-funded, our preservation standards will give you security and peace of mind that you will find your work in the future and it will be guarded against corruption.

And, should the need arise, the platform will migrate files to new formats for continued access and usability. All this is to ensure that your work and the work of your students is preserved for future study throughout time.

Get Started
Discover

- Do you want help to illuminate your published research globally?
- Are you interested in increasing your discoverability and citations?
- Do you want to share working papers or negative results?
- Do you use non-traditional publishing platforms?

CurateND was built to provide a first-class search experience through the portal. And, with well-structured metadata and optimization, we help ensure that publicly available content is listed prominently by outside search engines. Global access through one main platform increases discoverability and allows central tracking for downloads and citations at the individual, department, college or university level.

If you have other working papers and research results important to share with your research community around the world, CurateND is a perfect solution. And, if your research involves multi-media and non-traditional publishing platforms, CurateND will feature these works and seamlessly link to all related materials.

Get Started
Share

- Are you required to share your research, data and related works?
- Do you need to create a DOI for citing and sharing your data?
- Do you have images, posters, presentations, collections, white papers or datasets that you want to share?
- Do you want to highlight the work of graduate and undergraduate research?

For those with grant-funded research and data sharing mandates, CurateND puts your front-end data management plan into action. You have the ability (rights not withstanding) to share content at any level—from restricted access, to lab or campus access, to open access for the world.

CurateND can create a DOI on demand, linking to works on your behalf. A DOI is a convenient (and often required) way to cite your data in publications and it makes it easy for others to cite your work. You can share all of the associated work and multiple data formats that are not supported by the publishing platform.

It is equally valuable for featuring the important contributions of undergraduate and graduate research across all disciplines. All members of the campus community can create an account and contribute to intellectual fabric that is Notre Dame.

Get Started
About RUniverse

RUTGERS UNIVERSITY LIBRARIES
About RUniverse
https://rucore.libraries.rutgers.edu/research/about/

RUCore: Rutgers University Community Repository

Free Assistance and Advice

We will assist you with preparing grant proposals and designing your data strategy. The RUniverse team consists of experienced digital information professionals who work with data, write and manage grants and serve as peer reviewers and consultants for granting agencies, including the National Science Foundation.

We can offer data management advice in:
1. Identifying your data model. What data are you capturing and how does it interact with other data in your research environment?
2. Designing a metadata strategy. How can I describe my data to ensure that colleagues in my field and those in other disciplines can find and reuse the data?
3. Capturing your data. What is the best methodology for capturing my data, for further analysis and for sharing with others? Is this a spreadsheet, a database, an XML document, or something else? If my community already has a data format, how can I readily transfer the data I collect to that format?
4. Making your data discoverable in your search portal. RUCore offers a search portal to your data that can be easily incorporated into your project website. As an example, see the Video Mosaic Collaborative and the Equine Science Center collection. We can help you select the right data elements and record displays to ensure that end users can find and use your research.

Customized Search and Retrieval Portal

Finding resources that meet your information needs depends on the metadata, or descriptive information, used. This metadata should reflect the terminology of your field as well as information that is meaningful to enable you to find and select the best information for your needs. Learn more about metadata.

At the same time, metadata should be standardized, consistent and enable your data to be shared with a global, multidisciplinary audience.

RUCore employs a sophisticated, flexible metadata strategy that can customize metadata to support your primary audience yet still be compatible with prevailing metadata standards. For an example, see the Video Mosaic Collaborative, an NSF-funded mathematics education video collection. Metadata is customized to reflect mathematics education practices and to support core audiences of mathematics education faculty, researchers and practicing teachers.

RUniverse incudes a portal application that enables you to select metadata elements to filter a search and to display in search results. The search and retrieval portal is easily incorporated in your project's website using a technology known as "iFrames."

Ongoing Management and Support for Your Data

RUCore, which includes RUniverse, is an important, core service for the Rutgers University Libraries. Many library faculty and staff are engaged in its support. The Rutgers University Libraries are recognized leaders among their peer institutions in digital repository development and have contributed significant open source software to the field. We are committed to the long time persistence and availability of your data and are continuously developing new tools and services as well as upgrades to the RUCore platform to manage the digital resources we support. You can be confident in the long-term sustainability of data deposited in RUCore.
Is there a fee for placing my data in RUresearch?

RUcore accepts all types of resources that represent the significant intellectual output of the university. This includes faculty journal articles and other scholarly publications, theses and dissertations for degrees awarded by Rutgers University, and resources such as data sets that result from the research process. Individual resources, such as individual data sets that involve simple cataloging and storage, such as the example data sets currently available in the RUresearch portal, can be accepted at no cost. The same is true for electronic journal article preprints and post prints.

The library will consult on your data management plan or grant at no cost, but managing data for a large research project, such as projects generally funded by grants, involves significant work and planning that will generally require a fee for service. The services we offer include customizing metadata and providing both ongoing cataloging and storage and management of data and associated documents and software. This fee can be accommodated through cost recovery charges in the grant budget, either as a data management fee or through the involvement of library faculty and staff as co-P.I.s or researchers on the grant, with associated line item cost recovery. This will be a one-time, cost recovery only fee that can be incorporated into the grant proposal budget. Data will be preserved and made accessible for the long term at no additional cost to the project beyond the one-time initial cost. However, that initial cost, although negotiable, will be based on the amount of work and effort anticipated for the life of the project.

Robust Preservation

The Rutgers University Libraries’ RUcore initiative includes a Data Curation Research Center and a Data Curator who participates actively in digital preservation research and development. The Rutgers University Libraries are internationally recognized as being on the forefront for digital preservation standards and practices, particularly for digital video. We currently employ “industry best practices” for digital file preservation, including:

- Multiple backups and restoration practices, including online, nearline, offline and offline storage of files.
- Continuous file integrity checks, such as checksum assignment and checking.
- Persistent identifiers that use metadata to continuously locate a file, even if it is moved during routine storage reallocation. When you reference a citation URL, you can be confident that the file will be retrieved.
- Storage of files in multiple formats. One or more canonical formats that are vendor independent and conform to non-proprietary standards are employed whenever feasible. The original file format is also always maintained. We are currently transcoding most numeric data sets to comma-separated values (CSV) format. We are also currently investigating XML (Extensible Markup Language) and RDF (Resource Description Framework) for web based canonical formats, as well as community specific data standards such as the DOI (Data Documentation Initiative) for social science and survey data, and SensorML for sensor data. If your community uses a specific data storage format, we will explore its use with you.

Learn more about preservation
Metadata

Metadata is simply “data about data.” Metadata helps the data owner organize and manage the data he or she creates. It’s primary role, however, is to make sure that data can be discovered and reused by others. Well-designed metadata should support four core user needs, known by the acronym “FISO,” for “find,” “identify,” “select,” and “obtain.”

- Can the user find the information he is seeking?
- Can the user identify what she has found? E.g., if the user is looking for a video, does the metadata record clearly indicate that the described resource is a video?
- Can the user select the most appropriate resource, when several are retrieved, based on the metadata records? E.g., if the user is looking for air quality sampling that measures nitrous oxide levels, can the determine which resource among many air pollution data sets includes nitrous oxide sampling?
- Can the user obtain the resource quickly and easily from the metadata record?

Good metadata is responsive to the information needs of its user community. It captures the information most important for that community, using terminology that is accurate, current and meaningful to that community. It also needs to be consistently applied and shareable with a broader community. Metadata standards evolved to enable consistency and broader sharing of information. One of the oldest and most famous is Dublin Core, a 15-element metadata standard that is widely used. Many research communities have evolved their own standards, such as Darwin Core for biological specimens and DDI (Data documentation initiative) for survey-based data. RUCore employs a very flexible, sophisticated event-based metadata implementation that supports many different metadata standards but is largely independent of any one standard. We can display and export records in many different standards, including the standard your community uses. We can also design customized metadata that can support many standards or serve as a community standard, specific to your project’s needs.

Learn more about metadata

Access Control

RUCore can assist you with controlling access to your data. Creator(s) of data own the copyright to that data. The rights holder has the right to determine access and reuse of the data. Because of this, you will need to provide RUCore with a non-exclusive license to manage your data and make it available for others to use. We currently offer two methods of access control. We will work with you on a rights statement explaining what use others may make of your data. This provides important information for end users about reuse of your data. We can also embargo your data for a time period of your choosing. Metadata about your data will appear in the portal, but an embargo note will indicate that the data is not currently available for re-use. This will raise scholarly awareness of your data, so that others will not duplicate your work unnecessarily or will contact you directly for further information about your data and its availability.

Associated Information

The research process is a complex ecosystem of information. Research frequently begins with a grant proposal or other methodology for establishing a hypothesis and a research proposal. Data is collected, and throughout the collection process, documents are created, such as lab or experiment notes, survey questionnaires, images, video, etc. Instruments such as sensors, particulate collectors, telescopes, microscopes are used to collect and analyze data. Maintenance or calibration records for those instruments can be important when collection practices must be justified or explained. Specific software code may be written to process and analyze the data. At the end of the research process, peer reviewed publications share the conclusions and extensively reference the research data. From conception to collection to publication, the entire research process produces valuable data that should be collected and made available for others.
Capturing this associated data is more complex than storing and providing access to the data itself. Capturing the entire life cycle or information ecosystem of a data set is a three step process.

**Step One - the Infrastructure**

The first step is to build relationships between data objects within the repository architecture. RUresearch leverages the Fedora open source repository architecture by creating a compound object that pulls together the data, associated documents, such as code books, lab notes, images, associated software (such as MATLAB, R, or SAS scripts) intended to support the data, and instrumentation records, such as maintenance or calibration records. Resources that are dependent on the data for meaning and do not stand alone are included in the compound object for the project. Associated objects that are separately cataloged and may have different or additional creators, such as analyses, articles, books and presentations, are also related to the compound object. The repository infrastructure provides the groundwork for providing meaningful context.
Step Two - Capturing Associated Objects

Associated objects are captured in digital form and stored in the repository as part of the compound digital object for the project. They are preserved along with the data so all the effort is involved in the front end—capturing and uploading—but ongoing management is very light.

Step Three - Providing Context

There are many different objects that can be captured, at any stage of the research process. Organizing these and making them available in a meaningful way is deceptively complex. Think of your own most recent research project. Can you immediately locate your IRB protocol if a question comes up about making personally identifiable data accessible? Can you find the lab notes created by the student who graduated two years ago took—the ones you kept because his insights were so valuable? Assuming you can find those notes, do you remember which of the three graduate students that year actually took the insightful notes? Do you have documentation of his permission to share those notes, and can you credit him for their creation? Valuable information often gets lost or discarded because it is just too hard to manage it all and remember the context of its creation. Even when you remember the context, you may not want to see it all the time, or to share all context with everyone. It’s important to you that you have publicity releases for all the graduate students who appear in your videos but sharing those releases with the world at large violates the privacy you are at pains to protect. RUCore’s answer lies in its innovative and unique data model and metadata implementation. RUCore uses a metadata implementation that captures information useful for finding information but also information useful for managing information. Rights metadata, one of the types of information collected, is largely kept hidden from the general user. Documents associated with rights, such as publicity releases or IRB protocols, are not available for public display but are available to RUCore administrators and will soon be available to collection owners. The context surrounding any information, such as a research project, is situated in place and time. Separate objects can also have separate access controls for availability to different audiences, allowing for both public-use and restricted use versions of data which may contain sensitive information. RUCore uses metadata “events” to document the “who, what, when, and where” of context about research and its supplementary materials.
Data is central
The data itself remains central for discovery and use. RUresearch offers flexible portals that can configure metadata displays to show different levels of context. Creators of data may need different information than users. Users in the primary research domain may need different information than users in a broader multidisciplinary context. The libraries will work with researchers to present information about research data in ways that are meaningful and clear.

Data-centric View

Events
- Situate each lifecycle event in place and time, with associated objects and agents.
- Events can be displayed or not in different portals.
- Data is disambiguated from its context for more efficient reuse. But the context is always there to be retrieved.
- No limit to the number and type of events that can be added.
Virginia Tech's Data Repository (VTechData) is a platform for openly publishing datasets or other research products created by Virginia Tech faculty, staff, and students.

Content Policy
The purpose of VTechData is to highlight, preserve, and provide access to work produced by the Virginia Tech community and the intellectual output of the university in its land-grant mission. VTechData and Virginia Tech serve the Commonwealth of Virginia, the nation, and the world's community through the discovery and dissemination of new knowledge.

Data and associated materials will be accepted in any language and in a variety of forms and formats. Through the deposit process, depositors are encouraged to provide adequate documentation to ensure usability and accessibility, and should include discipline-specific documentation in a separate file, where appropriate. VTechData staff may be able to provide some of these services.

VTechData Publication and Curation services include:
• minting DOIs for datasets that can be included in articles or other publications
• assistance with file conversion for preservation and long-term reuse
• assistance with organizing and documenting complex file structures and project data
• assistance with generating contextual or disciplinary metadata

If you wish to take advantage of these services, please contact data services at vttechdata@vt.edu.

Access Policy
The general intent of VTechData is to make data and other research products openly available to the general public; however, we recognize that certain research situations necessitate restricting access to content for a certain period of time. Restricted objects can be deposited in VTechData if they can, within a well-defined and reasonably short period of time, be made openly accessible to the general public via de-identification or anonymization processes. For assistance, please contact data services at vttechdata@vt.edu.

Restricted objects will be discoverable but not accessible under the terms of deposit. Do not deposit sensitive or confidential data in VTechData; while we make every effort to maintain the privacy of restricted data, any server can be vulnerable. Sensitive data should not be stored online. If you have questions, please contact us.

Deposit Policy
By depositing data or other research materials into VT’s Data Repository, you affirm that:
• the deposit represents your own work or the work of your collaborators; any work that is not your own must be properly cited.

Please read our Deposit Agreement before depositing your work.

Members of the Virginia Tech community own copyright in their scholarly or educational works as described in VT Policy 13009 and VT Policy 13015. Copyright owners depositing their works in VTechData retain their copyright while granting a non-exclusive license to Virginia Tech's Libraries for access and preservation purposes. All depositors must agree to the non-exclusive distribution license or place their works in the public domain.

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